LONG ISLAND GROUP
Sinclair TIMEX

L.I.S.T.ING

January 1986

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MEETING NOTES - DECEMBER 1, 1985

The December LIST Group meeting was held at Huntington Public Library at 2:00PM on Sunday, December 1. There were 21 Members in attendance. The Treasury was reported sound and is anticipated to show a surplus at year end. Membership number 129 has been assigned and current active membership stands at 118. Some members have paid in advance for next year (one has even paid up through October '87).

Elections wereheld for the 1986 officers. The results were:

President: Chuck Russell
Treasurer: Steve Kaye (Pro tem)
Newsletter Editors: I. Goldsmith & P.Donnelly
Librarians: Tape-C. Russell
Paper-T. Skapinski
Corresponding Sec'y: J. Street
Data Base Coor'd: M. Cohen

NEXT MEETING

The officers will be installed at the January meeting, which will be held in the Huntington Public Library at 2:00PM on January 12th.

The use of bulk mail was discussed; while rates are low, delivery is slow. Steve Kaye was asked to investigate and report on the savings/benefits of this method.

ANNOUNCEMENTS

Nazir P. reported on the Spectrum 128. There are 2 units in the U.S. that he knows about. One is with SUM and the with Bob Dyl (EMC). Reviews are forthcoming, but the unit seems to have simple bank-switching, the TS 2068 Sound Chip and RGB. A review appeared in the December issue of Your Spectrum. Nazir notes that the SCLD (S) are not TS 2068 type. Nazir also showed us a Zebra Expansion Interface - Version 2. Zebra has taken delivery of the first 100 boards and is shipping these. As reported earlier, the board has "twister" capabilities (I.E.Spectrum (bus), TS 2068 bus, and circuit patterns necessary for mounting a Spectrum ROM on board, and fitting the RGB circuit and jack. It can also be used as a mini-development board. M1 disconnect and reset splice are provided. The current version has been tested successfully with A&J, wafadrive, IF one, and the disk drives.

Stewart N. announced specials on QL, Scott Foresmen books and bare board interface prices for LIST members. Call for the QL deal. The IF boards may be the next group hardware project. Zebra will not sell bare boards outside the group as they cannot be supported that way (i.e., no warrantee). Stewart expects to receive a CPM module from Portugal on Monday, December 2nd. He panned the Sinclair TV.

The Scott Foresman books (reviewed in back issue of LISTing) will be available at the January meeting for $3.00 each. Zebra also has a number of working and broken ZX81's for sale, cheap. Also announced were:Tech Draw Junior which uses a joystick instead of the Koala pad, and new software for CBM64. Finally, Stewart mentioned that because of basic design limitations, the use of any but Zebra (TF) drives with the Zebra Disk Drive system voids the warranty. M script is now available on disk.

Cedric B. noted some problems with is Zebra disk controller and Stewart volunteered to provide a new one.

DEMOS & HARDWARE

Bob Gilder and Nazir helped Myles C. build his Oliger emulator, just before the meeting. Most people who bought the boards have assembled them, now.

Mart B. showed us his 8 bit "centronics" port which he built using only some pullup resistors, a connector, and the sound chip on the 2068.

Stoney McK demoed his QL. He showed us some very nifty graphics routines, as well as the standard application packages. Another QL was hooked up to an RGB monitor with excellent results.

Jeff S. gave many members a first hand look at professional software development. He hooked up his A&J, Hot-Z Centronics printer and bank-switched 16K rampack and started throwing code in an attempt to provide a print spooler or buffer. Not quite ready yet, but it is possible.

Paul D. showed us a $25 monitor from American Design Components. It works, but he recommends only experienced hobbyists try it.

SUBSCRIPTION NOTICE

Please check your mailing label. Above your last name you will see the month and year in which you will receive your last issue of LISTing (LLIST) Newsletter. If this number does not agree with your records please let us know. This is a good time too, to request information on specific subjects for next years newsletters or just let us know what your special needs are.

LIST GROUP
P.O. BOX 458
CENTERPORT, N.Y. 11721-0458

IN THIS ISSUE

JANUARY 1986

NEXT ISSUE!
Special Anniversary Issue
The complete LISTing Index - Compiled by Reins Remken. Lists all issues of LISTing and the index to articles from issue #1 through January '86.

AVAGADRO'S NUMBER

By Myles Cohen

I ALWAYS BELIEVED THAT THE BEST WAY TO LEARN A SUBJECT WAS TO LEARN FROM A TEACHER. IF THAT WASN'T POSSIBLE THEN TEXT BOOKS WERE SUPPOSED TO BE THE NEXT BEST...

I HAVE FOUND THAT I'VE BEEN MISTAKEN ALL THESE YEARS. I AM THINKING SPECIFICALLY ABOUT MY COLLEGE CHEMISTRY TEACHER WHO SPENT THREE FUTILE WEEKS TRYING TO TEACH US THE MEANING OF AN ELUSIVE CONCEPT CALLED A MOL.

"A MOL IS AVAGADRO'S NUMBER OF ATOMS OF AN ELEMENT. ITS WEIGHT IS DIFFERENT FOR EACH ELEMENT BUT EVEN THOUGH THE WEIGHTS DIFFER, THE AMOUNT IS THE SAME. DO YOU SEE?" NO WE DIDN'T.

"I'M SPEAKING OF THE GRAM MOLECULAR WEIGHT OF AN ELEMENT. THERE ARE 6.02 TIMES 10 TO THE 23RD POWER ATOMS IN A MOL. THAT IS AVAGADRO'S NUMBER. NOW DO YOU UNDERSTAND?" WE JUST SAT AND LOOKED BLANK.

"WHY DO YOU JUST LOOK AT ME? I AM BEING AS CLEAR AS I POSSIBLY CAN. WHAT'S WRONG WITH YOU PEOPLE? A MOL IS THE GRAM MOLECULAR WEIGHT OF A SUBSTANCE WHICH, ALTHOUGH THE SAME AMOUNT AS ANOTHER SUBSTANCE, HAS A DIFFERENT WEIGHT." WE KNEW HE WAS USING THE ENGLISH LANGUAGE BUT WE GOT NO MEANING FROM IT.

TEXT BOOKS ARE NO GOOD FOR THE SAME REASON. THEY ARE PRINTED IN ENGLISH BUT THEY ARE NOT VERY EASY TO LEARN FROM... PERHAPS BECAUSE MOST TEXT BOOKS ARE WRITTEN BY TEACHERS. SOMEONE ONCE EXPLAINED THAT IF TEXT BOOKS WERE UNDERSTANDABLE, MOST TEACHERS WOULD BE OUT OF A JOB. PERHAPS SO...

BUT TEACHERS ARE NOT THE ONLY ONES WHO CAN BE ABSTRUSE. IF YOU REALLY WANT TO GET LOST AMONG VERBIAGE, TRY READING THE INSTRUCTIONS TO MOST SOFTWARE WRITTEN FOR THE TIMEX SINCLAIR COMPUTERS. FROM "VU-CALC" TO "VUT-Z" TO "SMART TERM 2"... I COULD GO ON AND ON AND ON.

TRYING TO UNDERSTAND THE INSTRUCTIONS FOR MOST DATA BASE PROGRAMS AND WORD PROCESSING SOFTWARE IS SOMEWHAT AKIN TO MOUNTAIN CLIMBING WHILE WEARING ROLLER SKATES. ALL THIS HAS BEEN BUT PREAMBLE...MY MAIN GRIPE CONCERNS THE LITERATURE [illegible] AND USE OF

Viewpoint

HERE I THINK IT MIGHT BE WELL TO TELL YOU A BIT ABOUT THE EXTENT OF MY COMPUTER KNOWLEDGE. I BOUGHT MY FIRST COMPUTER THREE YEARS AGO. A TIMEX 1000 WAS THE ONLY ONE IN MY PRICE RANGE. IT LOOKED LIKE A TOY. THE INSTRUCTION BOOK'S ASSURANCE THAT EXPERIMENTATION WOULD IN NO WAY HURT THE COMPUTER GAVE ME THE CONFIDENCE TO GO AHEAD AND I SLOWLY AND PAINFULLY STARTED TO LEARN HOW TO USE BASIC. BEING SELF TAUGHT, I AM STILL IN THE PROCESS OF LEARNING BASIC.

AS I LEARNED MORE AND MORE ABOUT THE 1000, I FOUND THAT THE "TOY" WAS A REAL COMPUTER. THIS WAS NO FAULT OF THE TIMEX COMPANY BUT LARGELY DUE TO THE Z-80 MICROPROCESSOR IN ITS GUTS. IN ALL THE BOOKS I HAVE SINCE READ, IN ALL THE MAGAZINES I HAVE PERUSED, IN ALL THE CONVERSATIONS WITH ENTHUSIASTS I'VE HAD, I BECAME INCREASINGLY AWARE THAT YOU AIN'T NOTHIN' IF'N YA DON'T KNOW MACHINE CODE OR ASSEMBLY LANGUAGE.

OKAY, I'M WILLING TO LEARN. NOW DO YOU START? THE SAME WAY YOU LEARNED BASIC, FROM BOOKS. AND SO BEGAN MY QUEST FOR THE "PROMISED VIRGIN". THE TRUTH IS I WAS ONLY INTERESTED IN LEARNING ENOUGH SO THAT I WOULD BE ABLE TO USE ALL THE GOODY ROUTINES THAT WERE PUBLISHED. BUT I WAS TO BE FRUSTRATED AT EVERY TURN. THE ROUTINES WERE THERE BUT EVERY AUTHOR SEEMED TO ASSUME THAT HIS READER KNEW A GREAT DEAL MORE THAN I DID. EVEN WHEN I DECIDED THAT THE RIGHT WAY WAS TO START FROM SCRATCH AND LEARN ASSEMBLY AND MACHINE CODE FROM THE GROUND UP, I FOUND THAT ALL THE "HOW TO" BOOKS WERE WRITTEN BY PEOPLE WHO WERE BORN FROM A GENIUS GENE POOL AND EXPECTING THE SAME OF ME.

EACH AUTHOR FROM BAKER TO LOGAN TO LEVENTHAL TO ZAKS DESCRIBED EVERYTHING IN SUCH DETAIL THAT I CAME AWAY FROM EACH SESSION IN AN INCREASING STATE OF CONFUSION. I AM STILL THERE.

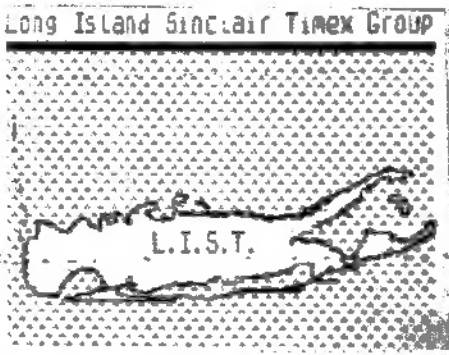
WHEN I READ THOSE BOOKS I FELT LIKE THE FELLOW WHO ASKS THE DOCTOR WHAT HE IS SUPPOSED TO DO ON THE WEDDING NIGHT AND IS HANDED SEVERAL VOLUMES OF ANATOMY, ANTHROPOLOGY, BIOLOGY AND EMBRYOLOGY. I REALLY THINK THAT THERE HAD TO BE A BETTER WAY.

THOSE MACHINE CODE BOOKS DESCRIBE REGISTERS, GO THROUGH LONG DISCUSSIONS OF TYPES OF INSTRUCTIONS, GIVE RAID LESSONS CONCERNING HEXADECIMAL AND BINARY NUMBER SYSTEMS, BOMBER YOU WITH TERMS LIKE "TWO'S COMPLEMENT" AND "FLOATING POINT" AND GIVE LISTS AND TABLES AT THE BACK. BUT NOWHERE IN ANY OF THEM ARE THEY UNDERSTANDABLE NOR DO THEY TEACH A BEGINNER HOW TO PROGRAM IN MACHINE CODE OR HOW TO THINK IN ASSEMBLY LANGUAGE.

PERHAPS IT'S ME AND IS AT FAULT. PERHAPS I'M TOO OLD, OR TOO DUMB, OR TOO LAZY, OR NOT MOTIVATED ENOUGH TO LEARN FROM THESE CRYSTALLINELY CLEAR BOOKS. I DON'T THINK SO. I THINK THAT SOMEONE SHOULD WRITE A SIMPLE BOOK ABOUT THIS LOW LEVEL LANGUAGE. AFTER ALL, IF A DUMB MACHINE CAN LEARN IT, WHY CAN'T I?

OH YES, I LEARNED WHAT A MOL WAS. NOT FROM A TEACHER INCIDENTALLY, BUT FROM SOMEONE WHO KNEW THE ART OF ATTACKING THE THING THAT HAS TO BE LEARNED TO A CONCEPT THAT ONE ALREADY KNOWS. "YOU'RE FAMILIAR WITH THE WORD "PAIR"? IT IS A WORD THAT DESCRIBES TWO OF ANY THING. YOU ARE ALSO FAMILIAR WITH THE WORD "DOZEN" WHICH HOLDS TWELVE THINGS. WELL, A MOL IS A THING THAT HOLDS AVAGADRO'S NUMBER OF THINGS. JUST AS A PAIR OF ELEPHANTS WEIGHS MORE THAN A PAIR OF SHOES...SO A MOL OF ONE ELEMENT CAN WEIGH MORE THAN A MOL OF ANOTHER. THE AMOUNT IS THE SAME EVEN THOUGH THE WEIGHTS ARE DIFFERENT. DO YOU UNDERSTAND?" YES I DO... FINALLY!

Long Island Sinclair Timex Group



LIBRARY TAPES UPDATE

Tape 4.6 has been distributed. Most members should receive their copy by Xmas. This will happen only if each member keeps the tape for the absolute minimum time. Remember, as soon as you get the tape, MAKE A COPY. Use only good quality (SONY HF90, or better, for example) tape to make your copy. Then use your copy. As soon as you are sure all the programs are there, send the original and your programs on to the next member.

Remember to be careful not to erase other members programs on the 'blank' tape. If you are not the first recipient, LOAD in the prior members programs, as listed on the attached sheet, before recording your own contribution. You also get a free peek at some of the programs which will be on 5.X.

Read back issues of LISTing for the tape library procedure. Members who do not submit a program (remember it can be any length,on any subject - no trivial submissions please) will be placed on a "back-burner" list for tape 5.X. You will still receive the tape, but not until the first run copies are all returned to us. This can take 6 months, unfortunately.

The same holds true for the "lazybones" out there. This way we'll save on mailing costs, duplicating costs and aggravation for the contributing members. You're considered a "lazybones" if you keep the tape more than 1 calendar week. There are no acceptable excuses. If you're on vacation have a friend pick up the mail and contact you, or use a commercial duplication service.

Please don't get cute. We (tape 3.5) received one submission back on a 29¢ tape. The member kept our HF60. Fortunately (?) the members progams loaded.

Some programs were submitted by non-members. We assume this means a member shared the tape outside the group. This is forbidden. Breaking copyright laws is illegal, breaking trust of other members is immoral, as well.

Some members have submitted programs with copyright notices in them. We have no way of knowing, short of seeing commercial ads for the program, whether it is permissible for us to use the submission. Giving a magazine publishing date helps. If it is your own work, and you wish to share with the group, but retain copyright, please state that in a REM. Remember, there is no documentation, except what's on the tape itself.

Brand new members take note: You may have missed the first mailing of 4.6. We'll have to wait for one to come back before we can send one to you. This should take no more than 2-3 weeks from the time you receive this newsletter. By the way, when new membership reaches 5, we'll send out a 3.5 too!

Second Anniversary Issue - Master Index - H.Henken LIST Group

Heniz Henken has compiled this list of the first two years of LISTing. He will also be entering the info into VU-file and we'll be putting the data file on an upcoming Library tape, which owners of VU-file will be able to merge with that program. This comes just in time, as with nearly 24 issues behind us, it has become almost impossible to remember exactly which issue contained which item.

A BIG "Thank you" to Heinz from your newsletter staff. This is the kind of member participation that will keep our group as successful as it has been.

TAPE CATALOG - "MULTI-TAPE"

Here's Bob Malloy's "multi-tape" program. With it, you can get a full catalog of all the programs on a tape. Instructions are in the program. You can enter and use the routine now or wait for Library tape #5.

```
  1 PRINT "If you have dungerous
 programs on a tape,e.g.LIST li
brary tapes, this program may h
elp. It uses   the header reade
r from SYNTAX   and saves the d
ata in arrays c, n$, t$.  (Up t
o 300 programs)"
  2 PRINT ""The first time use
option 3 from menu. Thereafter,
use option 4  BUT you must CLEA
R 63999 before loading the tape
 to use option 4! You can stop
reading headers  anytime by pre
ssing BREAK."
  3 PRINT ""Program will read b
oth 2068 and Spectrum headers b
ut will only  run on a 2068": P
RINT ""To get hard copy from op
tions 1,2,3,7 & 8 turn printer
on beforemaking selection"
  4 PRINT ""If program stops wi
th an error  enter GOTO 55 (Do
not use RUN)  DELETE lines 1 to
 4 when you arefamiliar with th
ese instructions"
  5 ON ERR  RESET
  6 PRINT """""""multi tape by
RUN": PRINT """Press any key f
or menu": PAUSE 0
  9 GO TO 55
 10 CLS : FOR 1=1 TO n
 20 PRINT 1;TAB 3;t$(1,16 TO 27
),n$(1)
 21 LPRINT 1;TAB 3;t$(1,16 TO 2
7),n$(1)
 30 NEXT 1
 40 STOP
 50 SAVE "multi tape" LINE 55
 55 ON ERR  GO TO 5
 56 LET dir=0
 60 CLS : PRINT ""Choose your o
ption by number"
 65 PRINT ""1. List all program
s "
 68 PRINT ""2. Find a specific
program"
 72 PRINT ""3. List all program
s on a          specific tape"
 75 PRINT ""4. Continue catalog
ing tapes"
 78 PRINT ""5. Start cataloging
 tapes"
 80 PRINT ""6. SAVE"
 81 PRINT ""7. See header readi
ngs"
 82 PRINT ""8. Show names of ta
pes"
 83 PRINT ""0. STOP"
 85 IF INKEY$="1" THEN  GO TO 1
0
 88 IF INKEY$="2" THEN  GO TO 1
00
 90 IF INKEY$="3" THEN  GO TO 2
00
 92 IF INKEY$="4" THEN  GO TO 9
850
 93 IF INKEY$="5" THEN  GO TO 9
970
 94 IF INKEY$="6" THEN  SAVE "m
ulti tape" LINE 1
 95 IF INKEY$="7" THEN  GO TO 4
00
 96 IF INKEY$="8" THEN  GO TO 5
00
 97 IF INKEY$="0" THEN  PRINT "
 Enter  GOTO 55   to Restart":
ON ERR  RESET : STOP
 98 GO TO 85
 100 CLS : INPUT "Name of progra
m? ";n$
 110 FOR q=1 TO n
 120 IF t$(q,18 TO (LEN n$+17))=
n$ THEN  PRINT q;TAB 5;t$(q,18
TO );n$(q): PRINT
 121 IF t$(q,18 TO (LEN n$+17))=
n$ THEN  LPRINT q;TAB 5;t$(q,18
TO );n$(q)
 130 NEXT q
 140 STOP
 200 CLS : LET dir=1: GO SUB 500
: INPUT "Name/side of tape? ";n
$
 210 FOR q=1 TO n
 220 IF n$(q, TO LEN n$)=n$ THEN
  PRINT q;TAB 4;t$(q,18 TO );n$
(q);t$(q, TO 3)
 221 IF n$(q, TO LEN n$)=n$ THEN
  LPRINT q;TAB 4;t$(q,18 TO );n
$(q)
 230 NEXT q
 240 STOP
 300 CLS : FOR 1=1 TO n
 310 PRINT 1;TAB 3;t$(1)
 311 LPRINT 1;TAB 3;t$(1)
 320 NEXT 1
 330 STOP
 340 STOP
 400 INPUT "Number Please? ";b
 410 CLS : FOR 1=1 TO n
 420 IF 1=b THEN  PRINT "1;TAB 4
;t$(1): PRINT ""Start Address "
;c(1,2): PRINT ""Data Length ";
c(1,1): PRINT ""Auto Start at "
;c(1,3): PRINT ""Prog/Vars Long
th ";c(1,4)
 421 IF 1=b THEN  LPRINT "1;TAB
4;t$(1): LPRINT ""Start Address
 ";c(1,2): LPRINT ""Data Length
 ";c(1,1): LPRINT ""Auto Start
at ";c(1,3): LPRINT ""Prog/Vars
 Length ";c(1,4)
 430 NEXT 1
 440 STOP
 500 CLS : PRINT n$(1)
 501 LPRINT n$(1)
 510 FOR 1=2 TO n
 520 IF n$(1)<>n$(1-1) THEN  PRI
NT n$(1)
 521 IF n$(1)<>n$(1-1) THEN  LPR
INT n$(1)
 530 NEXT 1
 535 IF dir=1 THEN  LET dir=0: R
ETURN
 540 STOP
9850 CLS : INPUT "Did you rememb
er to CLEAR 63999 before loadin
g this tape? Y/N ";c$
9855 IF c$="Y" OR c$="y" THEN  G
O TO 9870
9860 IF c$="N" OR c$="n" THEN  P
RINT AT 10,1;"Please CLEAR 6399
9 and reload this tape": ON ERR
  RESET : STOP
9865 GO TO 9850
9870 RESTORE : FOR a=64000 TO 64
052: READ b: POKE a,b: NEXT a
9873 INPUT "Name/Side of tape ";
p$: GO TO 9975
9970 CLS : CLEAR 63999: FOR a=64
000 TO 64052: READ b: POKE a,b:
 NEXT a
9971 REM c(n,1)=DataLength, c(n,
2)=Start Address, c(n,3)=Auto S
tart, c(n,4)=Prog/vars length
9972 DIM c(300,4): DIM n$(300,13
): DIM t$(300,28)
9973 INPUT "Name/Side of tape ";
p$
9974 FOR n=1 TO 300
9975 CLS : PRINT """""LOAD A TAP
E AND PRESS""PLAY""""""""
9977 LET n$(n)=p$
9980 DATA 55,62,0,221,33,60,250,
17,17,0,205,14,250,201,33,252,0
,205,34,250,58,33,250,211,244,2
19,255
9981 DATA 203,191,211,255,251,20
1,0,243,245,219,255,203,255,211
,255,219,244,50,33,250,62,1,211
,244,241,233
9982 RANDOMIZE USR 64000
9983 LET a=64060: LET b=PEEK a:
LET a=b
9984 IF b=0 THEN  PRINT "PROGRAM
: ";: LET t$(n, TO 17)="PROGRAM
"
9985 IF b=1 THEN  PRINT "NUMERIC
 ARRAY: ";: LET t$(n, TO 17)="N
UMERIC ARRAY"
9986 IF b=2 THEN  PRINT "CHARACT
ER ARRAY: ";: LET t$(n, TO 17)=
"CHARACTER ARRAY"
9987 IF b=3 THEN  PRINT "BYTES:
";: LET t$(n, TO 17)="BYTES"
9988 FOR a=64061 TO 64070: LET b
=PEEK a: PRINT CHR$ b;: LET t$(
n,a-64043)=CHR$ b: NEXT a: PRIN
T
9989 LET b=PEEK a+256*PEEK (a+1)
: PRINT "DATA LENGTH: ";b: LET
c(N,1)=b
9990 LET a=a+2: LET b=PEEK a+256
*PEEK (a+1): IF s=3 THEN  PRINT
 "START ADDRESS: ";b: LET c(n,2
)=b
9991 IF s<>0 THEN  GO TO 9995
9992 IF b<1 OR b>9999 THEN  GO T
O 9994
9993 PRINT "AUTO START AT: ";b:
LET c(n,3)=b
9994 LET a=a+2: LET b=PEEK a+256
*PEEK (a+1): PRINT "PROG/VARS L
ENGTH: ";b: LET c(n,4)=b
9995 PAUSE 200: NEXT n: GO TO 99
75
```

LIST Group

January 1986

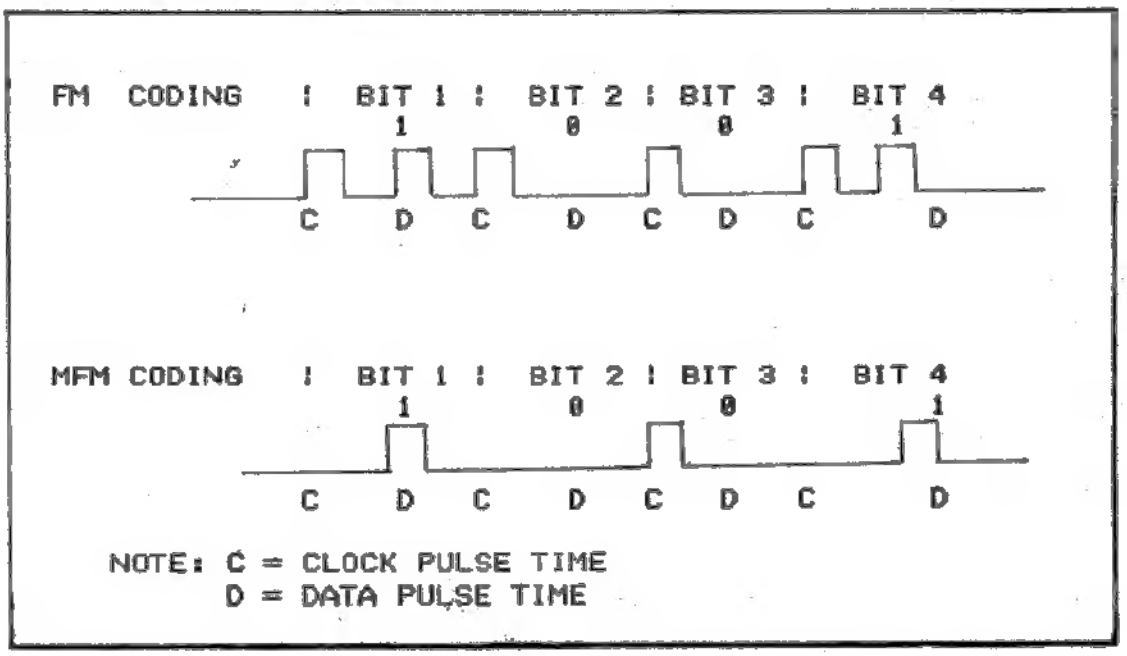
DISK DRIVE CONTROL AND INTERFACING (Part 2)

RECORDING METHODS - FM and MFM

The method of representing data as a stream of bits to be recorded on a floppy disk is up to the disk controller. All that the drive does is faithfully record the pulses that are sent to it and reproduce them on demand. Due to the size of the head gap, there is a lower limit to the size of the pulse that can be recorded reliably using a given drive. The size of the pulse obviously determines how much data can be recorded on the disk, and disk drives are made in two types - single density and double density.

The only difference between a single and double density drive is the size of the head gap. You can use a double density drive in a single density application but, obviously, not vice versa.

Fortunately, apart from one or two exceptions (such as Apple), most computers use either the FM (Frequency Modulation) and the MFM (Modified Frequency Modulation) method of recording data. All that is needed is a representation of 0 and 1 that can be easily decoded. The FM method is generally used for single density recording and it works by recording the data and a stream of clock pulses. The clock and data pulses are easily recovered from the data stream using either a simple monostable or a phase locked loop. The MFM method is a little more complicated in that no clock pulses are recorded unless a pair of zeros occur together.



Formatting and Soft Sectoring

Now that we have a method of recording information on a disk, the next question is how to organize the storage data. Each track could be treated as a unit of data storage and one complete track read and written to at a time, but this involves a large amount of data (approximately 2K). A better method is to divide each track into a number of smaller units called sectors.

The number of sectors into which a track is divided varies between systems. Typical sector sizes are 128, 256 or 512 bytes. Using a sectored disk any data can be found by giving two pieces of information - its track number and its sector number. (The track and sector numbers are often quoted together and referred to as a "disk address".)

It is easy to see how the drive can find any given track: starting from a known track - say, track zero (T00) - it simply steps in the required number of tracks. But how does it find a given sector?

There are two methods of indicating which sector is about to pass under the read head: hard sectoring and soft sectoring. A hard sector uses "sector holes" to mark the start of each sector in the same way that the index hole marks the start of each track. Finding a given sector is simply a matter of counting the number of sector holes that have passed under the index sensor since the last index pulse. For various reasons hard sectored disks are not used very much these days and most systems use soft sectoring.

A soft sectored disk has information recorded on each track that allows the drive to read the number of the data sectors about to pass under the read head. Each sector is made up of two portions, an ID field and a data field. The ID field contains unchanging information about the nature of the sector and is not re-written during normal disk operations. To create the pattern of ID and data fields on a diskette it has to be formatted, and the format program is generally the only software that writes ID fields. You can think of ID fields as sort of a magnetic equivalent of the sector holes used by hard sectored disks, but ID fields are more versatile because they can be read to discover the sector number of the data about to pass under the read head.

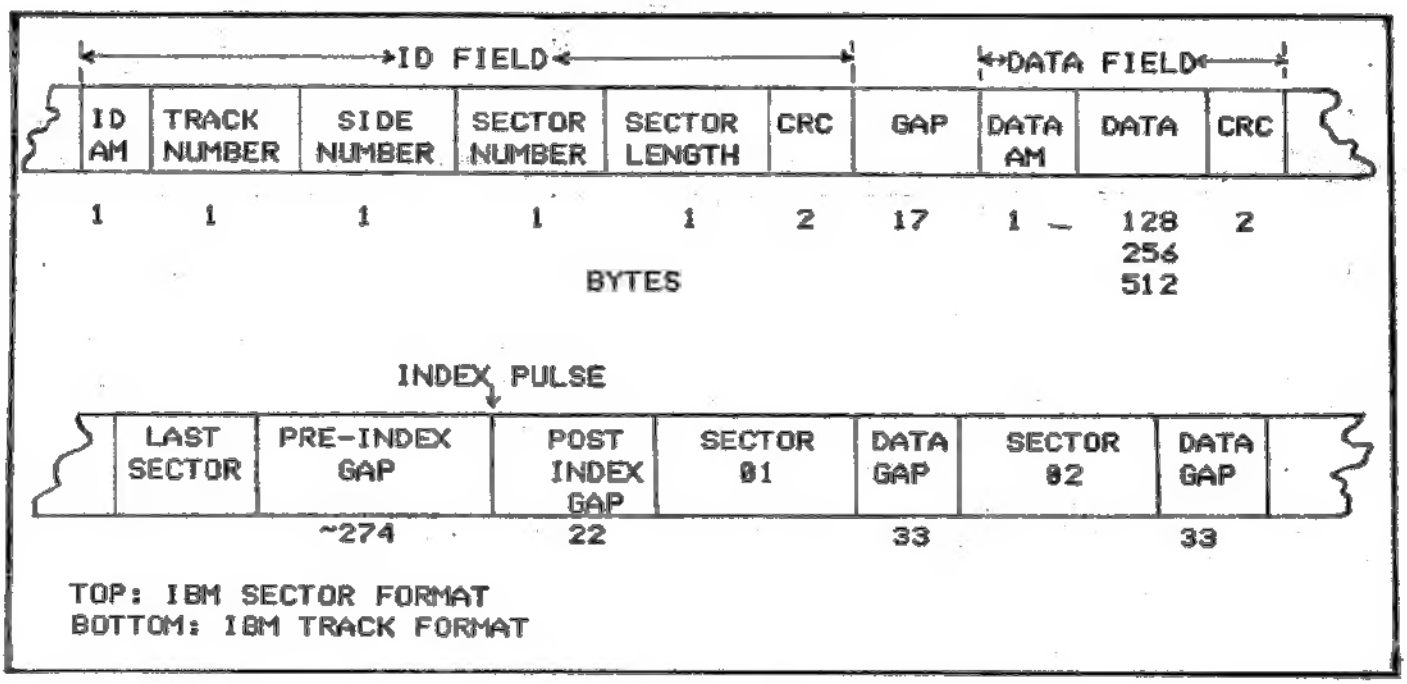
There are a number of different ways to format a disk but nearly every system either uses or can use a format that is close to the IBM 3470 standard. You can see the exact construction of both the ID and data fields that make up a sector in the diagram on the next page. The track number is also recorded in each ID field to enable the head's current position to be verified. The length of the data portion of the sector is also recorded as a simple code: 00 = 128 bytes; 01 = 256 bytes; 02 = 512 bytes; 03 = 1024 bytes.

For synchronisation purposes, there are a number of special data patterns or address marks that are recorded on the disk. These address marks correspond to sequences of pulses that can't normally occur because they lack various clock pulses. In that way the disk hardware can identify an address mark without any doubt. Different address marks are used to signify the start of the ID field (the ID address mark) and the data field (the data address mark). At the end of each of the ID and data fields are two Cyclic Redundancy Check (CRC) bytes, used to make sure that data has been read without error. CRC bytes are computed when any field is written and recomputed when any field is read. If the recomputed values don't match the recorded values then the

data has changed since it was written to and a read error should be reported.

As well as address marks signifing the start of each field, there must also be gaps between fields and between the sectors to allow for timing inaccuracies. There must also be a gap following the index hole at the start of a track and a gap after the last sector before the index hole. Thus there are four types of gaps and each has a unique format to help with the detection of the address marks. The complete format of a track follows below the sector format diagram. The standard IBM 5 1/4 inch format gaps are made up as follows:

1. Post index 22 bytes made up of 16 FFH followed by 00H
2. ID 17 bytes made up of 11 FFH followed by 00H
3. Data 32 bytes made up of 26 FFH followed by 00H
4. Pre-index 274 bytes made up of FFH



TOP: IBM SECTOR FORMAT
BOTTOM: IBM TRACK FORMAT

Acknowledgement: Electronics & Computing Monthly - Mike James

Next month we will cover the disk controller in part 3 of Disk Drive Control and Interfacing.

.....Bob Gilder

A HANDY KEYWORD AND FUNCTION TABLE

The TS2068 Computer has well over a hundred keywords, functions and symbols. You must at times have had some difficulty locating the right key for a certain keyword, function or symbol, especially if it's one you don't use that often.

I have typed out the below table, which you can cut out (if you prefer, send me a BUSINESS-size SASE -22 cents stamp- and I'll mail you an original printout). Glue it to a piece of 2.5 x 14.5 inch cardboard and it fits neatly on the top part of your computer. With it, you have all the information at hand which will enable you to find the key needed. So as not to clutter up the Table, there are no instructions on HOW to access the needed keywords etc. After all, you should at least know that much. The Table is strictly a means to find the KEYS.

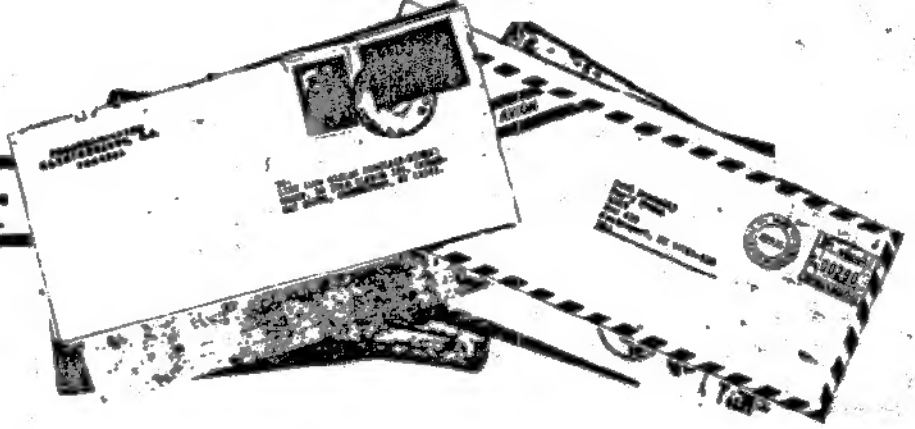
I have included all keywords and functions, but left out all symbols except the three (3) which are not normally obtained with the Symbol Shift key ([,] and \).
I also included the three (3) hidden symbols ({,} and ©).
Furthermore, the two (2) hidden functions "CONTRAST" and "TRANSPARENT". By "hidden" I mean "not shown on the keyboard keys". I hope this Table will help you.

Cedric R. Bastiaans, 3 Cassie Court, Mt. Sinai, NY 11766

KEYWORD	KEY	KEYWORD	KEY	KEYWORD	KEY	KEYWORD	KEY	KEYWORD	KEY
ABS	G	©	P	DATA	D	FORMAT	O	INV. VIDEO	4
ACS	W	CAPS LOCK	2	DEF FN	1	FREE	A	INVERSE	M
AND	Y	CAT	9	DELETE	O				
ASN	Q	CHR$	U	DIM	D	GO SUB	H	LEN	K
AT	I	CIRCLE	H	DRAW	W	GO TO	G	LET	L
ATN	E	CLEAR	X			GRAPHICS	9	LINE	3
ATTR	L	CLOSE #	5	EDIT	1			LIST	K
		CLS	V	ERASE	7	IF	U	LLIST	V
BEEP	Z	CODE	I	EXP	X	IN	I	LN	Z
BIN	B	CONTINUE	C			INK	X	LOAD	J
BORDER	B	CONTRAST	9	FLASH	V	INKEY$	N	LPRINT	C
BRIGHT	B	COPY	Z	FN	2	INPUT	I		
		COS	W	FOR	F	INT	R	MERGE	T

KEYWORD	KEY	KEYWORD	KEY	KEYWORD	KEY	KEYWORD	KEY	KEYWORD	KEY
MOVE	6	PAUSE	M	RETURN	Y	STR$	Y	VERIFY	R
		PEEK	O	RND	T				
NEW	A	PI	M	RUN	R	TAB	P	{	F
NEXT	N	PLOT	Q			TAN	E	}	G
NOT	S	POINT	8	SAVE	S	THEN	G	[	Y
		POKE	O	SCREEN$	K	TRANSPARENT	8	]	U
ON ERR	F	PRINT	P	SGN	F	TO	F	\	D
OPEN #	4			SIN	Q	TRUE VIDEO	3		
OR	U	RANDOMIZE	T	SOUND	G				
OUT	O	READ	A	SQR	H	USR	L		
OVER	N	REM	E	STEP	D			November '85	
		RESET	P	STICK	S	VAL	J	Copyright ©	
PAPER	C	RESTORE	S	STOP	A	VAL$	J	C.R.Bastiaans	

Letters to the Editor



11/24/85

TO: Charles Judge
Prince Frederick, MD

SUBJECT: LIST LIBRARY TAPE 4.A

Charles:

I could not LOAD even one program directly from this tape, neither from my regular tape player nor from my spare deck, neither with nor without my WINKY BOARD 2000.

I tried many different combinations of volume and tone settings. I even tried, for the first time ever, to adjust the head alignment on the player - no luck!

Out of desperation, I attempted to make a direct copy of the library tape, playing from my spare player to the AUX input on my regular deck.

Eureka! I am now able to LOAD all the programs from my copy. But I don't understand how I could make a copy from the library tape yet not be able to LOAD from it.

I am sending a copy of this letter to LIST. Perhaps Cedric Bastiaans will have some ideas.

If you have similar problems or, for that matter, if you have no trouble at all LOADing from the tape, I'm sure that LIST would be interested.

I am also enclosing a BASE in hopes that you will let me know your results. I would also be very interested to hear how you make out LOADing the programs ("explain-z", "here-z" and "decr-z") that I have SAVEd on the spare (60 min.) tape. This might give me some idea how "compatible" my tape deck is.

Regards,

Lloyd Painter

Shaketown, PA

W. Paul McConnaughey
Pensacola, Florida 32503

Nov 11, 1985

L.I.S.T.
Centerport N.Y
11721-0438

Enclosed is my check for $15 to renew my subscription which expires in Dec.

I recently visited Paris and checked in the department store, to see if we could buy Spectum+ or QL cheaply.

The Spectum"+" was about $180 (U.S.) and the QL was about $500 (U.S.); so it appears it isn't worth the Trouble.

The Spectrum software had cheaper prices but was in French and of little use.

Phil S

Lloyd:

Sorry about the trouble. I suspect, as Cedric so often says, that it was a 'level' problem. That is, the volume on the copy you received was too low, and the only way to boost it was to make a copy. Copying usually risks losses, particularly of higher frequencies, but apparently it did work this time.

Just a wild thought, was the library tape copy you received a Sony HF90, or another brand? We did use a new brand for some of the tapes this time. Sometimes there is insufficient oxide on the tape and it just won't record at the necessary level. This is a common occurance with 3/$1.00 tapes, but should not happen with good quality (SONY, BASF, TDK,etc) tapes. I even use Sony HF 60's, with two holes drilled in the back, as digital data packs for my ADAM. I find the $.69 price more palatable than the $4-9 retail price.

Cedric, what do you think?

Thanks Phil:
Your observation corroborates other reports we've heard. P.D.

November 22, 1985

PAUL DONNELLY
L.I.S.T. GROUP
P.O. BOX 438
CENTERPORT NY 11721-0438

ALBERTSON COMMUNICATIONS, INC.
225 Valley Place
Mamaroneck, New York 10543
(914) 698-7707

Dear Paul,

For others that might be interested... attached is what I found is necessary to to use a RS-232 cable between a WAFADRIVE and a XEROX Memorywriter...

This is probably also usefull for most serial printers..

Best regards,

Stan Nagrod

Thanks Stan:

I'm sure other members are interested. The RS-232 standard is so misunderstood (by manufacturers) that this is exactly the kind of detailed, one printer, one interface explanation that many of us need. P.D.

LIST Group

National Timex Sinclair Users' Network
T.S. Services
P.O. Box 15214
Fort Worth, TX 76118-0214

L.I.S.T.
P.O. Box 438
Centerport NY 11721-0438

Gang,

Received and enjoyed your newsletter as usual. Many good articles. I was suprised to Mr. Dan Negrus letter to me in it. I have no objection to you publishing what you want, but it was always been our policy at TSS Newsnotes to check it out before printing. Nobody contacted me to see if I had responded, or what. I must assume nobody contact Mr. Negrud as he would have told what is doing on.

I retelved Mr. Negrod complaint and acted by placing a long distance phone call to him. Two of the three programs have been shipped and the third one will be shipped soon. The lateness of the shipment was due to both our TS 2068 being down at once, for over two months, and a small mix-up on the agreement to market the third program, with the author, which has now been corrected.

T.S. Services is still in business, and working hard to get caught up. We have started taken orders for QL User and Sinclair magazines at $36.00 a year for each. We have started a software library service on you will note in our last newsletter. We are now selling QL and QL products at a price we think is better than anybody for Network Members. Our full members can orders ONe from us for $200 with shipping.

We also have about 200 names and address in New York of owners who have the TS 1000 computer through a popular mail order BASIC course. If you would like to contact these owners send a list of ZIP codes for the areas you are interested in and I will provide a count of address per ZIP code. Your group will have to furnish a letter per person and I will mail them for you at $.20 per name. This program is based on our policy not to furnish a owners name to outside sources unless the owners agrees. Of course, if we are contacted by a owner in your area, thinking our local support, we will inform them of your group.

Harry Christmas,
Dan Barnard
Network Manager

WHJ DATA SYSTEMS
TIMEX-SINCLAIR SOFTWARE
4 BUTTERFLY DRIVE
HAUPPAUGE, NEW YORK 11788

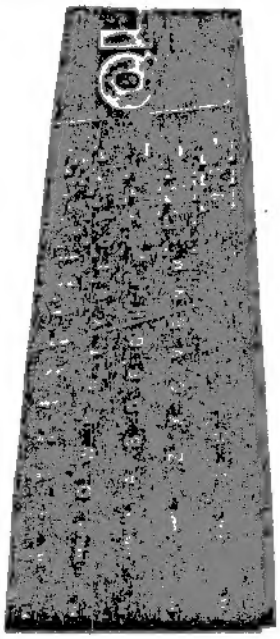
Paul -

Here's our holiday sale catalog. Please note our low prices, Sinclair QL computer $275.00, TS 2068 Quickwilve $12.95 3 for $30.

I also noticed that in your last issue of LIST you mentioned you needed Chris Bystrom's address. It is 609 East N. 18th Street, Abilene, Tx. 79601.

We have mailed stuff to him at the above address recently. P.S. Happy Holiday!

Bill



Tom:

Thanks for the prompt response (as usual). As you can see, Stan's letter, explaining the outcome of his problem, arrived just a few days before yours. P.D.

List Group

Santo Domingo, D.N.
Noviembre 25, de 1985

LIST (LOS SIBLAN SINCLAIR-TIMEX) GROUP, 10 ISLE ELEPOR 190, OCEAN-BAY DRIVE, CENTERPORT, NY 11721

PARA: P E O C E S O.
CASA NICOLAS PENSON #38, EDIF. "ITALO"
ENSANCHE BAIROA, SANTO DOMINGO.
REPUBLICA DOMINICANA.

SUBJECT: IDENTIFICATION OF:
OUR NEW USER COMPUTER GROUP.
FIRST DOMINICAN USER GROUP'

THE OBJECT IS TO LET YOU KNOW ABOUT US, AND OUR ACTIVITIES RELATED TO COMPUTERS.

WE ARE INTERESTED IN ANY INFORMATION THAT HELP US TO MAKE OUR CLUB BEYTER. (SOFTWARE).

WE NEED TECHNICAL INFORMATION OR SOFTWARE FOR: IBM-PC, IBM-XT, COMMODORE 64, SANYO MBC-555, ALTOS COMPUTERS SYSTEM.

IN SHORT, WE WOULD LIKE TO RECEIVE ANY LETTER OR INFORMATION THAT YOUR FAMOUS CLUB MAY SUPPLIES TO US.

SINCERELY: FELIPE A. PIQUERAS
GENERAL MANAGER

Felipe Piqueras: - Sorry, we don't have any. PD

List
Long Island Sinclair Timex Group

12/8/85

LIST GROUP
P.O. BOX 438
CENTERPORT,NY.
11721-0430

TO JEFF STREET CORRIS.SEC.:
JEFF I'M ENCLOSING MY CHECK FOR THE NEXT YEARS MEMBERSHIP. MY SUBSCRIPTION CURRENTLY EXPIRES A/O FEB.86. PLEASE CHECK MY ADDRESS AT THE END OF THE LETTER BECAUSE I ALSO HAVE AN APARTMENT WHICH IS #4F. SO FAR,THERE HASN'T BEEN ANY PROBLEM RECIEVING MY NEWSLETTER,BUT BETTER SAFE THAN SORRY. WILL YOU ALSO PLACE ME ON A MAILING LIST TO RECIEVE MEMBERSHIP LIBRARY TAPES? I WOULD REALLY LIKE TO SEE SOME OF THE PROGRAMS URITTIAN BY MEMBERS OF THE GROUP.

AS A CORRISPONDING MEMBER,MY CONTRIBUTIONS TO THE GROUP HAVE BEEN NEXT TO NOTHING DURING THE PAST YEAR. EXCUSES SHOULD PROBABLY FOLLOW, BUT INSTEAD I'LL TELL YOU I'M PLANNING TO DO BETTER IN THE FOLLOWING YEAR. FIRSTLY, MY HARDWARE IS IMPROVED WITH THE ADDITION OF A WESTRIDGE MODEM AND A AMDEK COLOR 500 MONITOR. BY THE WAY, THE AMDEK 500 WAS AN EXCELLENT BARGAIN. HARMONY VIDEO AND COMPUTERS IN BROOKLYN IS SELLING IT FOR $222.00 DOLLARS. THE DATA ORGANIZATION OF MY SYSTEM IS ALSO GREATLY IMPROVED. THAT MAKES IT ALOT EASIER TO GET THINGS DONE.

I HAVE SOME THINGS NOW THAT MAY BE OF INTEREST TO THE GROUP. AS YOU ARE PROBABLY AWARE THERE IS A MACHINE CODE TUTORING COURSE PROGRAM AVAILABLE FROM SEVERAL SUPPLIERS. KNOWLEDGE OF THE VOCABULARY OF MACHINE CODE PROGRAMING IS AN ABSOLUTE NECESSITY IF YOU WANT TO WRITE 'MC'. I HAVE A VOCABULARY DATA PROGRAM WHICH IS NOW APX. 10K IN LENGTH FOR THE 2068. THE PROGRAM IS SET UP TO RANDOMLY PICK A DEFINITION FROM THE DATA LIST AND DISPLAY IT ON SCREEN IN QUESTION FORM. AFTER THREE WRONG GUESSES THE CORRECT WORD, INSTRUCTION,ETC.,THAT FITS THE DEFINITION IS DISPLAYED. SORT OF LIKE FLASH CARDS. NEW WORDS CAN BE ADDED SIMPLY BY ADDING NEW DATA LINES TO THE PROGRAM. IF ANYONE IS INTERESTED,I CAN DOWNLOAD THE ENTIRE PROGRAM TO ANOTHER 2068 COMPUTER. SEND ME A POSTCARD WHEN YOU CAN CALL. I'M AVAILABLE FROM 8:00 PM TO 10:00 PM MONDAY THRU THURSDAY. WHEN I SEE THE TIME ON THE POSTCARD I'LL PREPARE MY TERMINAL AND WAIT FOR YOUR CALL.

NEXT YEAR WE SHOULD CONCENTRATE ON FINDING A COMPATABLE DISK DRIVE SYSTEM THAT IS COMPARABLE IN PRICE TO THOSE OFFERED BY OTHER COMPUTER COMPANIES. I THINK THE TAPE DRIVES ARE A POOR COMPARISON TO DISC DRIVES. DISC DRIVES HAVE A FASTER RATE OF DATA TRANSFER. USING TRACK AND SECTOR THEY ALSO ACCESS BLOCKS OF DATA (LIKE PROGRAMS FOR EXAMPLE) MUCH FASTER. WITH THE PRICES OF DISC DRIVES DROPPING ALL THE TIME IN THE U.S. FOR OTHER MACHINES,I THINK ANY MORE TIME ON TAPE DRIVES IS A WASTE OF TIME.

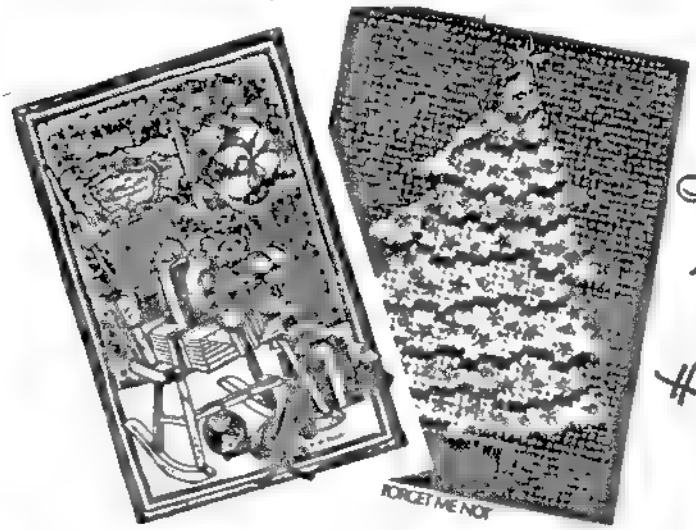
SINCERELY.
Mr. Patrick Fagan

PATRICK FAGAN
1532 OCEAN AVE.#4F
BROOKLYN,NY.11230

Patrick:

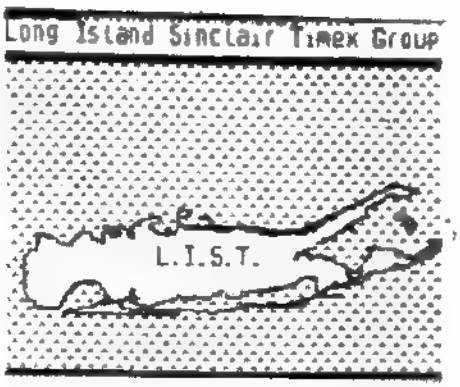
Your program sounds great. Perhaps it could be of immediate help to Myles C. At any rate, I'm sure it would make a fine addition to the library, you should be receiving the package soon. Glad to hear your system is improving and of your upbeat attitude. P.D.

Our thanks to Joan K., Harvey P. and the other members who sent us holiday greetings. Like the information on Chris H.(who says Texas is a big state! P.D.



Many good wishes
for a wonderful
holiday

Harvey



Christmas is a magic time.
Warmest wishes
for a wonderful Christmas
And happiness always.

P.S.
1. My news about Chris Nystrom is he joined the navy and has a Boston address.
2. Received with appreciation Tape #11 on 11-27-85 and on same day forwarded it to Steve in The Colony, Texas.
3. Best Holiday Wishes.
4. I enclosed S.A.S.E., please return the blank Letter to me!

HARVEY P.

Thanks for putting out such a great news-letter & for the amount of personal attention received by members (tapes questions answered). Joan Kealy

P.S., Six!

Chris Nystrom is now on assign in the U.S. Navy near you. In fact, I suggested he join LIST - probably been too busy yet, that's what went with Abilene TSDG. Anyhow, Chris really enjoyed putting out his newsletter nearly single-handedly and missed doing it so probably would love to contribute to LISTing. Address: Ensign Christopher G. Nystrom
(LSD-37) USS Portland
Fleet Post Office
New York, N.Y. 09501

from J. Kealy

In Plata: 16 de Noviembre de 1985

Paul Donnelly
Sec'y Treas
LIST
Box 420
Centereport, NY 11721-0420
USA

Dear Paul:

Recently I've read your letter in the August/Sept. II Computing magazine. I'm in a TS2068 users group here in Argentina, and we are very interested in receiving your monthly newsletter. We are interested to subscribe it from that describing the complete [illegible] cross-reference and how to use microdrive with the 2068.

We want to know too how to buy that translator "clamo" program.

Sincerely.

Amengol Torres Sabate

Amengol Torres Sabate:

I suggest you contact a former LIST member - Patricio Rodriquez Valiente
PO Box 461
LaPlata (1900)
Argentina

The information you seek on the cross reference has also been published in Syntax, CATS (Capital Area) and other newletters. An extract from one of these is attached.

Membership in LIST, for non-U.S. members, is described on the attached "Policy" sheet as well. PD

TS 1000 Types Take NOTE!

Gary S. Brown
7300 Almeda Road #1308
Houston, TX 77054-2137
(713) 790-0217 even.
November 27, 1985

I am offering for sale a Sinclair ZX-81/Timex 1000 computer system which I have assembled and used for three years. As far as I know, all of the items below are in good working condition. If you purchase something and promptly find that it is defective, I will promptly refund your money or otherwise make a mutually agreeable settlement. Wherever possible, I have noted (in parentheses) the price originally paid for each item. If you are interested in more than one item, I can probably pass on the savings in shipping cost. Telephone or write to obtain additional information and to confirm availability before sending a check. Prices quoted include shipping to any address you designate in the continental United States.

HARDWARE

The following items make up an enhanced Sinclair/Timex system which probably would have cost me over $1000 when I purchased it.

Sinclair ZX-81 ($80) Assembled from kit. Worked the first time it was plugged in and never failed once.

Alphatronic Professional keyboard and metal case ($114). Compared to a real typewriter, the action is sluggish, but it's a big improvement over the original membrane keyboard.

Random Access EVC-2 direct video converter ($89). I installed this add-on board kit which provides composite video output (use any standard TV plus green or amber computer monitor) through a coaxial cable along with a case-mounted switch which selects either dark-on-light or light-on-dark output. TV output is still available through the original RCA jack.

Q-SAVE Cassette Interface ($49). A 9 volt battery powered amplifier/filter box plugs in between the computer and tape recorder. In combination with the Q-SAVE software, it greatly speeds up and improves the efficiency of loading and saving software, even commercial software which was developed without Q-SAVE (assuming you can terminate program execution or have access to a disassembler). Highly recommended.

Novatech 64K Bitpack ($183). This add-on unit provides quite a bit of extra memory for program, variable, and machine code storage, but the extra memory doesn't quite total 64K, as the name implies.

Dual AC Power Adapters. I have directly wired the original Sinclair adapter to the computer. This eliminates accidental disconnection and enables simultaneous use of a second (3 amp) adapter in the power socket, providing a total of 1.65 amps. When additional peripherals (such as a disc drive controller) are added to the system, extra power is needed to eliminate screen flicker.

$2000 or best offer.

Games

$1 3D Monster Maze, Sinclair Research Ltd. Requires 16K. Impressive graphics but I could never figure out how to play the game.

$3 Krazy Kong, Interworks Inc. ($19). A well implemented (but also) simple adaptation of the Donkey Kong arcade game.

$5 The Mined Gems Reg 1, Timex ($8). Ranking, Robot, Maze.

$2 The Mined Gems Reg 2, Timex ($8). Memory, Concentration, Squaring.

$5 The Cube Game, Timex ($8). Rubik's cube by computer.

$2 Superman, Timex ($9). A maze game that allows you to create your own.

Applications

$3 The Organizer, Timex ($ 10). A simple data base program.

$5 It Pro/File, Thomas Wade ($17). An excellent data base program with excellent documentation.

$8 VU-CALC, Timex ($20). A simple spreadsheet program.

$3 Statistics, Timex ($10). Statistics, Chi-Square, Graphs.

Programming and Utilities

$5 Hot Z, Sinsoft ($20). A very good assembler/disassembler. This and a 200 assembly language primer are all you need to learn machine code.

$10 Hot Z-II, Sinsoft ($25). An excellent assembler/disassembler. A must for the serious programmer. The documentation is thorough but assumes you know a lot.

$5 ZAP Macro, Sinsoft ($14). A Timex/Sinclair ZAP labeling program for use with Hot Z or Hot Z-II. It does not, however, use Logan's disassembly codes.

$5 Z Extra, Sinsoft ($19). A high quality program which enables you to efficiently prepare, store and display screens.

$5 Quickdrive, Kevin Jones ($12). A useful, well done, and well documented series of machine language programs which quickly perform functions such as scrolling, screen clearing, input checking, etc.

$5 Z-Tools, Sinsoft ($16). A useful, well done series of machine language programs which enable you to more easily edit programs and to merge two BASIC programs.

The following items are for sale individually:

$15 Timex/Sinclair 1000 Computer ($100). Purchased in case spare parts were needed for the other computer, which fortunately they weren't. It was plugged in once and worked fine. Otherwise, it is brand new and still in the original carton.

$20 Timex/Sinclair 1016 16K RAM Module ($15). Purchased for use in testing shorter programs would run in this memory, but only used once or twice. Virtual like. In original carton.

$80 Alphacom 80/100 Printer ($150). Plugs directly into the computer and prints on plain adding machine paper. Can do split screen program listings. Works fine but slowly and noisily. Includes 1 amp power supply which powers both computer and printer. No documentation.

$100 Anaco XD-2A Floppy Disc Interface ($200). This never-used add-on board probably works fine, but I never succeeded in getting it hooked up to my computer and disk drive. You may have to purchase another connecting cable (not included) from Anaco for make your own). Includes one 5 1/4" DSDD floppy disc with DOS software.

$100 Compumax FDC-100 Floppy Disc Interface ($200). This seldom used add-on board requires a special terminating resistor pack (470-1000 ohm) in the disc drive system it controls. I was never able to find this part, and Compumax never answered my letters requesting help. In spite of this, I somehow succeeded in getting the board to work once or twice, and it did its job as advertised.

$300 MPC Dual Floppy Disc Drive SK100DB ($500). Two single sided, double density 5 1/4" disc drives in a sturdy case with built in power supply. Performed fine when I could get the interface cards working properly. According to reviews, it is slower than some other drive units, but even at its slowest it is substantially faster (and more convenient) than cassette storage, even using Q-Save. The documentation available is not much help in getting the DIP switches set properly. Includes 10 blank floppies.

Sinclair ZX-81 plastic computer case, including membrane keyboard. Free w/ any purchase.

SOFTWARE

Please Note: All of the following software will be provided in the original package, on the original cassette, and with the original documentation. I will not keep any copies of any program, so any software purchase you make from me should be legal.

$5 Basic, Richard Lefebvre ($12). A series of machine language programs which enable you to use GOTO labels, renumber lines, delete a variable, etc. The programs are useful, but the documentation is terrible.

Utility Set, Bank Software ($10). Utility programs which renumber and block-delete lines and merge two BASIC programs. Useful only as examples of how not to program. Free with any purchase.

$2 Basic UTILITY #1 ($10). A program which prints tabulated, rounded numbers and three sorting programs for strings or numbers. Scanty documentation.

$5 Programmers Tool Kit, Software ($30). Eight programs for renumbering lines, searching for /replacing characters, and doing graphics. Documentation is scanty but adequate.

$5 Toolkit, International Publishing & Software ($17). Nine utility programs for renumbering (including GOTO,GOSUB), searching/replacing, merging programs, etc. Documentation is scanty but adequate. Useful.

$5 25 "short" blank cassette tapes: a few may not record, but most I tried did.

$5 45 "long" blank (more than half full) cassette tapes; same as above.

BOOKS AND PUBLICATIONS

$10 The Complete Timex TS1000/Sinclair ZX81 ROM Disassembly, by Ian Logan and Frank O'Hara, Melbourne House. (1984).

$7 Programming the Z80, 2nd edition, by Rodnay Zaks, Sybex. ($15). An introduction and reference guide.

$5 Z80 Assembly Language Subroutines, by Lance Leventhal and Winthrop Saville, Osborne. ($18). A reference book for the microprocessor which includes detailed explanations of numerous subroutines for performing rudimentary program operations.

$7 Z80 Applications, by James Coffron, Sybex. ($18). A readable introduction to hardware interfacing of the Z80 and related support chips.

$3 T-S Reviews, No. 1-8 ($16).

$5 Sinclair Quarterly, Winter 1982, Spring 1983, Summer 1983 ($10).

Free: March/April 1984 ($3). Free with any purchase.

$25 Sinclair, Volume 1 (1980) - Volume 5 No.11 (Nov. 1984) Complete. In vinyl notebooks ($100+). $22 if the notebooks don't have to be shipped..

Reference Card for the Z80, 8080, and 8085/8085. Cybernetic Software Systems. ($5) Free with any purchase.

List

This is Tasword II used with the Tasmen-Serial Interface and the Brother EP-44 printer.

The word processor naturally uses any of the keys on the 2068 that are labelled. I have been wondering for some time if it was possible to access the special keys on the typewriter through the ASCII codes and ESC or CHR$27.

The standard decimal codes for the numbers 0 to 9 are 48 to 57, 58 to 64 are : ; < = > ? @ which are accessible by just typing in those characters using symbol shift.

By redefining the printing codes in the Tasword system it is possible to access the special characters on the typewriter. In the following I have redefined the graphics on keys 1, 2, 3 and 4 to produce the special characters:

1 = @ 2 = $ 3 = µ 4 = ^

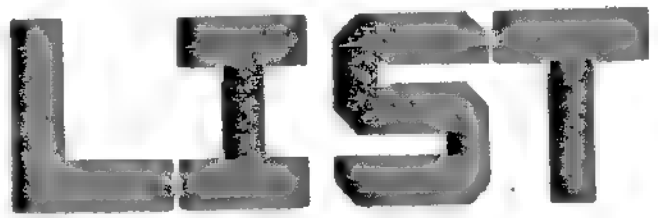
It is also necessary to set EP-44 for 8 Bit Code for most of the characters. For example the normal characters decimal 160 to 174 ! " # $ % & ' ( ) * + , - . /-are redefined in the 8 bit mode as follows:

á 160	170	Ç 128	Ý 139	Ô 150	± 241
í 161	½ 171	ü 129	ý 140	Ö 151	÷ 246
ó 162	¼ 172	é 130	Þ 141	Ø 152	° 248
ú 163	¡ 173	â 131	Ä 142	Ù 154	• 253
ñ 164	« 174	ä 133	Å 143	Û 155	
Ñ 165	» 175	à 134	É 144	£ 156	
ª 166		ç 135	æ 145	¥ 157	
º 167	ß 225	ê 136	Æ 146	₧ 158	
¿ 168	µ 230	ë 137	ô 147	ƒ 159	
⌐ 169		è 138	ö 148	ø 237	
			ò 149		

By defining those you want as "graphic symbol 27 dec code" the graphics you can use them in your wordprocessor text to be printed on the EP-44

BOB HOWARD, WA6DLI

Bob D. * First define graphics on Keys 1-9 in this form. The above are the decimal codes for all the special characters. I see my sub is up in '86 so here is my check for $15.00 LIST may be hard to read at times-- it is the best stuff around! Bob. L. Howard



Product Highlights

VENDOR REPORT

AN-te Productions, P.
9009 W. Elm Street, #2
Phoenix, Az. 85037

"Quickey 2068" keyboard overlays for Tasword II, Omnicalc & MScript $3.99 each + .50 P&H

WMJ Data System
4 Butterfly Drive
Hauppauge, N.Y. 11788

Reduced prices
Modem (2050) - $110 - QSilva $12.95
MScript - $22.95 - QL $275
ROM Switch $39.95 - Shipping $3.00

Zebra Systems
78-06 Jamaica Avenue
Woodhaven, N.Y. 11421

See meeting notes

Sinclair Research
One Sinclair Plaza
Nashua, N.H. 03061

QL - $299 plus $12.00 P&H
(no Tax)

[redacted]
PO Box 15214
Red Bank, TN 37415-0214 (615) 877-6328

Buyers Guide - QL, TS1000
TS2068 Products - List Price

BARGAIN CORNER

Brother EP-44	$119	On Sale @ Alexanders (May not still be on sale when you get this)
Ribbons	$8 for 3	Sears - regular price
Sinclair Pocket TV	$89	WMJ Data Systems
GE Computer Compatible Tape Recorder	$20	Consumers Distributors Comes with/ATARI/Commodore, IF too.

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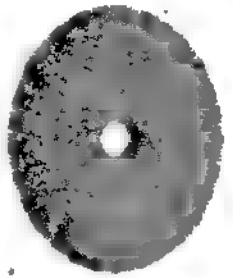
HAPPY BIRTHDAY  LIST
HAPPY BIRTHDAY  LIST
HAPPY BIRTHDAY  LIST
HAPPY BIRTHDAY  LIST
```



```
  1 CLS
  10 INPUT "Who has a birthday t
oday?      (Please enter your n
ame)";a$
  20 CLS   INPUT "What is your f
avorite color? (Enter a number 0
 to 9)";b
  25 CLS
  30 INK b
  35 BORDER b
  40 FOR f=0 TO 3: PRINT AT f,0;
"HAPPY BIRTHDAY  ";a$
  50 NEXT f
  60: BEEP .25,0  BEEP .25,0  BE
EP .5,2: BEEP .5,0: BEEP .5,5  B
EEP 1,4
  70 BEEP .25,0: BEEP .25,0  BEE
P .5,2  BEEP .5,0. BEEP .5,7. BE
EP 1,5
  80 BEEP .25,0  BEEP .25,0: BEE
P .5,0  BEEP .5,9  BEEP .5,5  BE
EP .5,4: BEEP 1,2
  90 BEEP .25,10  BEEP .25,10. B
EEP .5,0  BEEP .5,5: BEEP .5,7
BEEP 1,5
  100 FOR s=-40 TO 40 STEP 1  BEE
P .005,s  PLOT s+128,140: NEXT s
  110 PLOT 70,110
  120 DRAW 4,4,4040
 1000  STOP
 9999 SAVE "birthday" LINE 1
```

HACKER'S NOTE BOOK

Sheet No. of

Got tearing on your Sears monitor when used in composite mode? You may not be alone. Beku H. got this info from Sears. Note the changes in C401 & R401, and the reason.

App.

Subject SEARS RGB MONITOR #195.2135452

Date 11/1/85

IMPROVE COMPOSITE VIDEO

By

SEARS
DIVISION 81
TECHNICAL DATA SHEET
TELEVISION

DIFFERENCES

MODEL 195.2135452-SAME AS MODEL 195.2135451 EXCEPT:

IN THE CHASSIS ELECTRICAL PARTS LIST.

Schematic Location	Part No.	Description	Reason
C120	12-102811-3	Ceramic 1000pF (K)	To prevent tweet on channel 6.
R364	49-6015353	15K ohm	To facilitate brightness adjustment.
R401	49-6010453	100K ohm	To prevent picture load at top of picture.
C401	49-185203	Elect., 1mfd (M)	
C1204	49-201253-3	Mylar, 0.22mfd	To improve AFC operation.
R362	49-601235-3	12K ohm	To facilitate brightness level adjustment.
R363	49-603935-3	39K ohm	
VR402	49-24787-8	30K ohm	To increase V-SIZE adjustment range.

NOTE!

VOLUME BOARD

MAIN BOARD

TUNING AND CONTROLS BOARD

HACKERS NOTEBOOK:

ALBERTSON COMMUNICATIONS INC.
225 Valley Place
MAMARONECK, NEW YORK 10543
(914) 698-7707

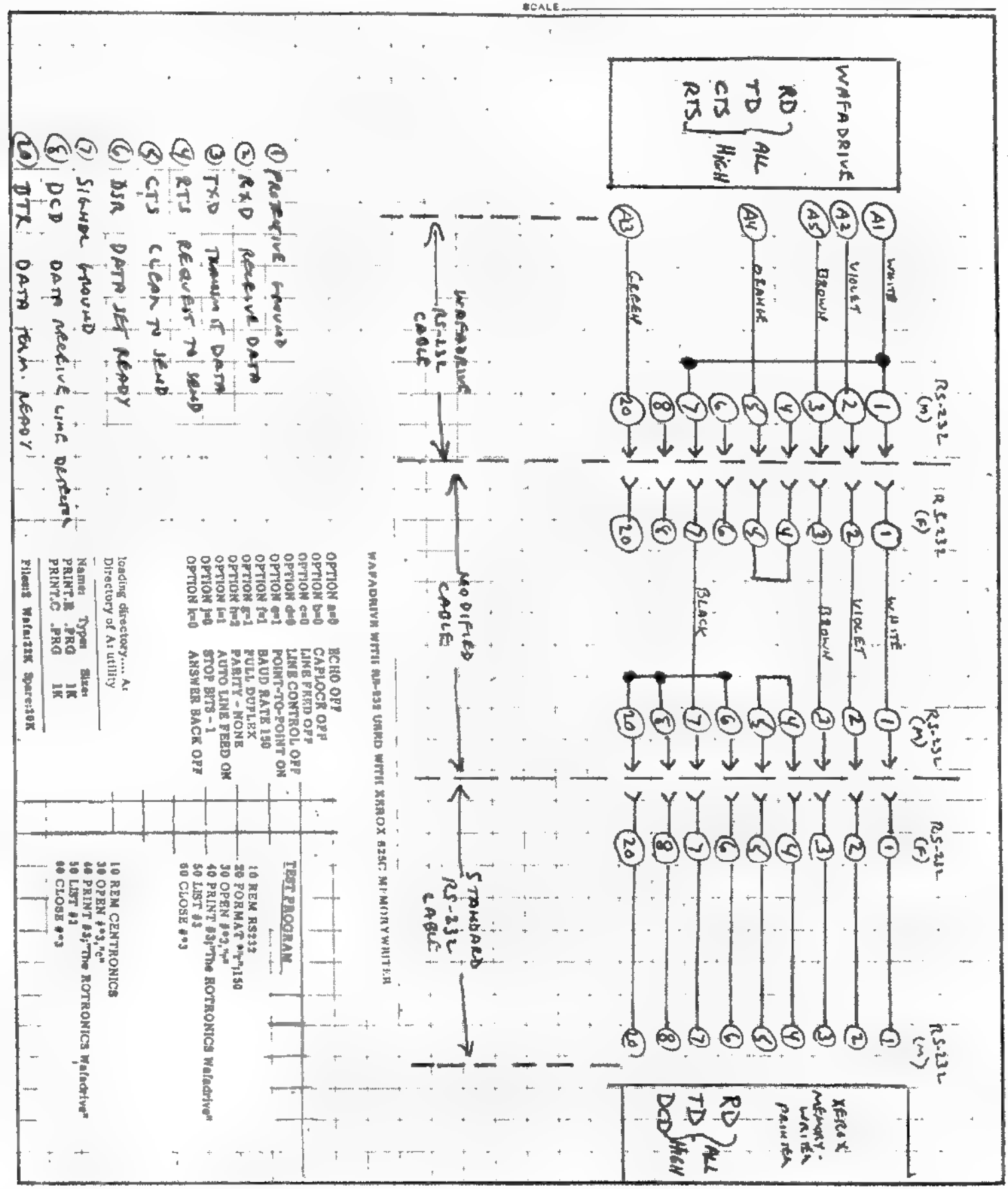
WAFADRIVE/RS-232/XEROX MEMORYWRITER

SHEET NO _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE 11-22-85

SCALE _____



GAVILAN PRINTER INTERFACE

N.PASHTOON , and J.BELL

In the Dec.'85 issue of LIST (p.17) a sample of the print of the Gavilan Computer's printer mechanism was shown. The mechanism is $20.00 and is still available from the American Design Co. American Design's ads. pretend as though the printer interface was Centronics compatible. This is not 100% accurate. In Fig.(1) the pin-out of the 34-pin Gavilan printer interface is illustrated. Note that the provision of the +12V and +5V power from outside, as well as the requirement of an active-high STROBE makes the interface non-Centronics. For your reference , Fig. (2) shows the top view (component side) of the 34-pin header on the printer mechanism circuit board.

The printer uses a NEC78ØØ series micro-computer , which makes the circuit board very compact.Initially , in order to find out why the printer did not work with standard Centronics signals , we had to do some amount of circuit tracing. The outline of the input circuitry of the printer is illustrated in Fig.(3). As can be seen ,the STROBE signal is applied to the CLK input of a '74 type DFF. As such data transfers will take place when a rising edge of the STROBE signal is detected.The printer also needs initialization , before it will do any thing for you. The initialization is achieved when you send the printer the code byte 17(11H). See example below.

In the Nov.'85 issue of LIST we published two Centronics interfaces, one of which was based ~~based~~ on the Intel 8255 PPI chip, and the other on the ZILOG Z8Ø PIO chip. We used these interfaces for our experiments.

For the 8255 based port the positive-going STROBE can be generated using software. To check the printer out , the following BASIC program can be used. The program prints the character and graphics set of the printer. The sample print is on page 17 of the Dec.'85 issue of LIST.

```
1Ø  OUT 127,137 :REM initialize the 8255. Port 127 is the Control port.
2Ø  OUT 59,Ø    : REM lower the STROBE.
3Ø  OUT 123,17  :OUT 59,1 : OUT 59,Ø : REM initialize the printer by
                                       strobing-in the init. code i.e 17.
4Ø  REM Now print the character and graphics set.
5Ø  FOR x = 32 TO 255
6Ø  OUT 123,x : OUT 59,1 : OUT 59,Ø
7Ø  NEXT x
```

STROBE PULSING

Actually a line 65 should have been included in the program reading 65 IF IN 63<>Ø THEN GO TO 65 : REM Port 63 is the BUSY port. for the purpose of checking whether the printer is BUSY. Since BASIC is slow such a check was not incorporated in the program.

For the Z8Ø PIO based design , since the chip generates $\overline{\text{STROBE}}$ automatically, an inverter is needed to generate the STROBE signal.Fig.(4) shows a bottom view of the printer, and the details of where to install the 74LSØ4 inverter. Note also that the STROBE trace has to be broken. The diagram also shows the power connections to the printer.

Next month we will provide MC printer drivers (for LLIST,LPRINT), and hopefully also TASWORDII compatibility.

NOTE: The printer uses thermal transfer ribbons with ordinary paper. OKIMATE 20 ribbon can be modified to work with it.The printer seems to be responding to ANSI control codes.

PIN #	PIN NAME	DIRECTION RELATIVE TO PRINTER
1	STROBE (POSITIVE GOING EDGE)	IN
2	DATA 1	IN
3	DATA 2	IN
4	DATA 3	IN
5	DATA 4	IN
6	DATA 5	IN
7	DATA 6	IN
8	DATA 7	IN
9	DATA 8	IN
10	$\overline{\text{ACK}}$ (LOW ACKNOWLEDGES RECEIPT OF DATA)	OUT
11	BUSY (LOW WHEN PRINTER IS READY)	OUT
12	$\overline{\text{PAPER}}$ (LOW WHEN NO PAPER)	OUT
13	SELECT	OUT
14	LOGIC GROUND	—
15	+5 VOLTS	—
16	GROUND	—
17	FRAME GROUND	—
18 TO 28	GROUND	—
29 30	NOT DEFINED	—
31	ERROR	OUT
32	GROUND	—
33	+12 VOLTS	—
34	+12 VOLTS	

FIG.1: GAVILANS PRINTER I/F SIGNAL DEFINITION.

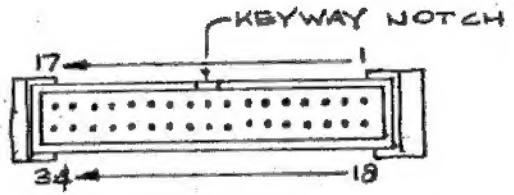


FIG.2: 34 POSITION HEADER CONNECTOR (RS #276 1525) ON THE COMPONENT (TOP) SIDE OF THE GAVILAN PRINTER MECHANISM CIRCUIT BOARD.

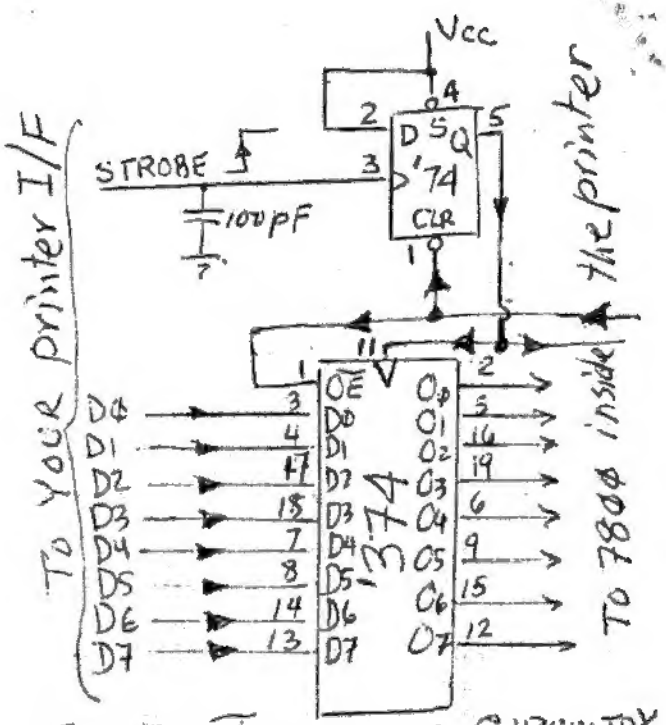


FIG.3 The INPUT CIRCUITRY OF THE GAVILAN PRINTER (AN OUTLINE).

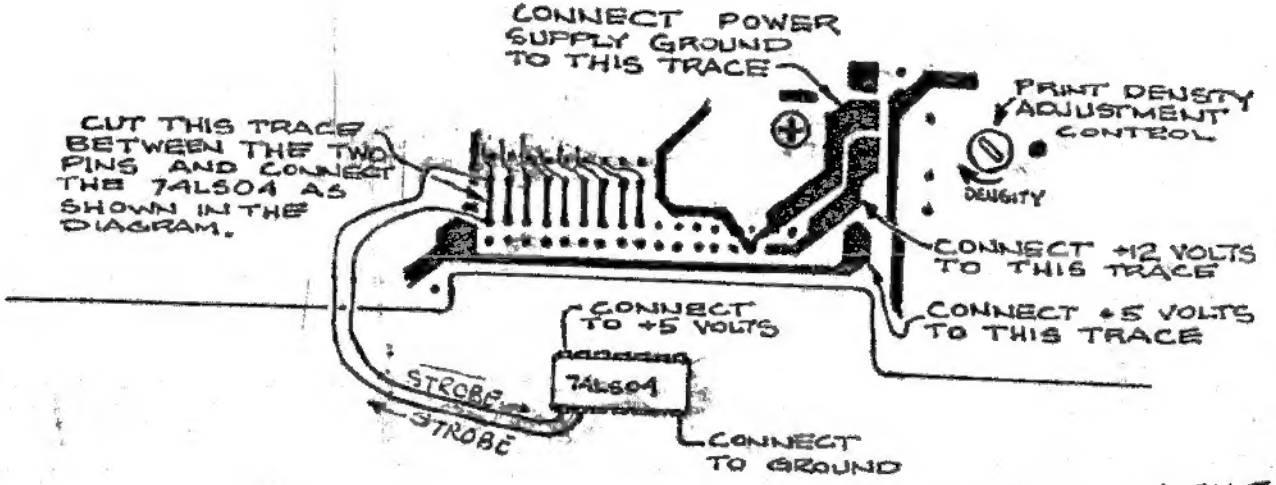


FIG.4: BOTTOM VIEW (SOLDER SIDE) OF THE PRINTER CIRCUIT, POWER CONNECTIONS & MODIFICATION FOR A STANDARD CENTRONICS PORT. (MODIFICATION NOT REQ'D. IF USING THE 8255 PPI)

ACTIVATING THE NMI ON TS2068
(HACKERS-ONLY PAGE)

By : NAZIR A. PASHTOON

In the July '85 LIST , mention was made of a special SIG meeting in which member-designed hardware was demonstrated. In that meeting I demonstrated a hardware tracer for the TS2068. The tracer specs. were drawn by me,and I supervised two of my associates in the design and testing. Further , whenever the TS2068 idiosyncracies will get in the way, I contributed to the design process. One of these circuits was used to unleash the NMI (Non-Maskable Interrupt) capability of the TS2068.

As you know when the $\overline{NMI}$ pin is brought low, the Z80 PUSHes the PC on stack and does a branch to address ØØ66H. In the existing ROM, when that happens, the machine performs a NEW, instead of servicing a user specified routine whose address (non-zero) may be stored in the system variable NMI at 5CBØH-5CB1H. The culprit is one byte of code in ROM location ØØ6DH. The existing byte reads JR NZ(2ØH). If this byte is changed to read JR Z(28H) instead, the NMI gets activated. The circuit shown achieves this. →

Basically the circuit detects the address ØØ6DH , when an op-code fetch is happenning (M1 cycle),generates a low going strobe for de-activating all ROM and RAM in the system (via $\overline{BE}$) input. Instead the circuit shoves the desired byte i.e. 28H (= JR Z) down poor Z-80's throat. In effect the circuit the circuit just changes that one byte of HOME ROM. The circuit implemented is shown to the right.

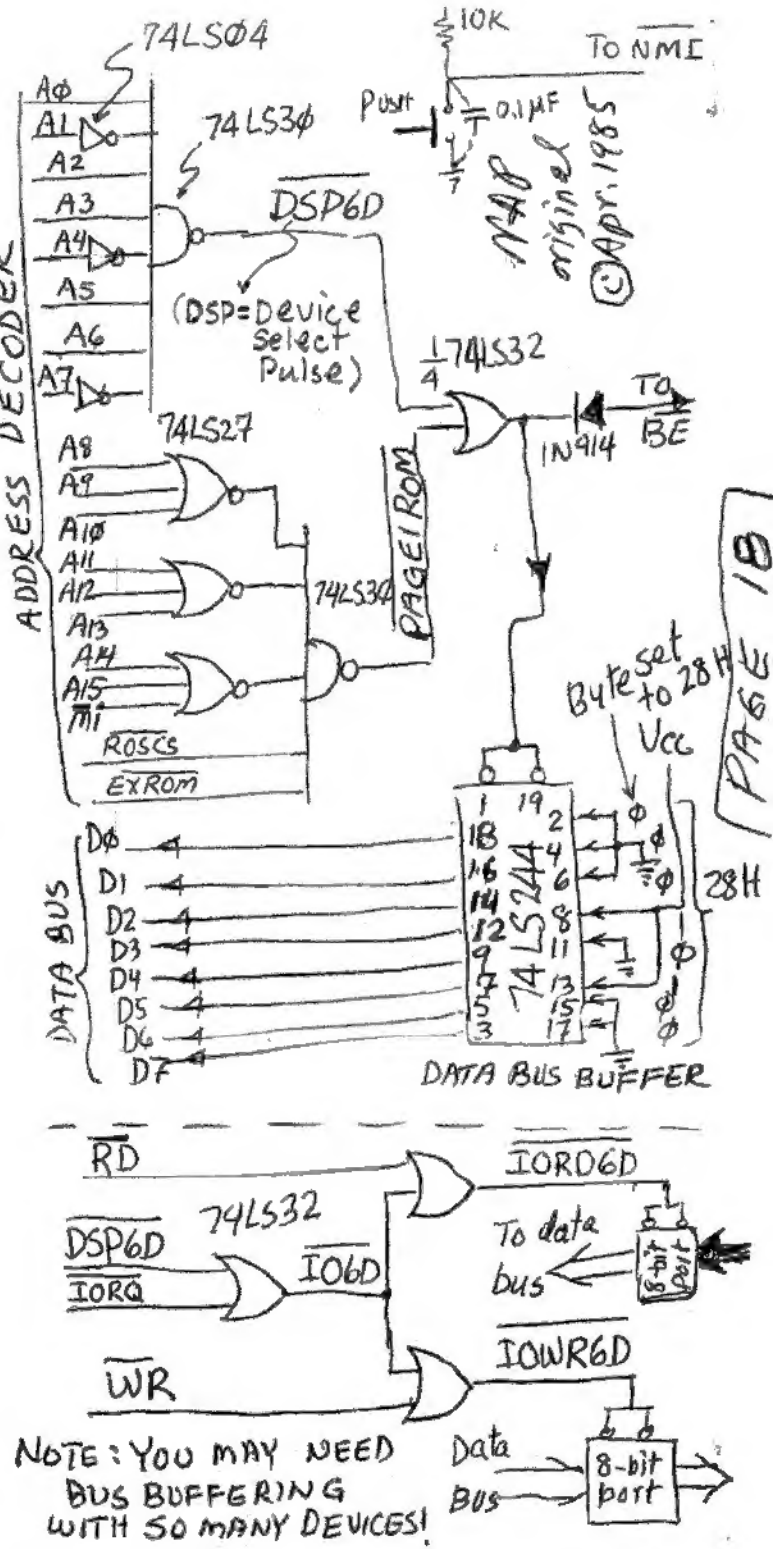
I hope that you can see the implications of the technique especially as applied to high speed communication, data acquisition, enabling an external EPROM+RAM (software breaking), or shadowing some of the ROM routines with your own , or changing the character set , or real-time clock, or.....I can go on and on.

Oh Yes ! you should organize your routine such that you save all the registers (including the alternate set), by using the stack. Don't forget the I register.Also recall that the stack already has the PC on it, you might as well POP that, so you don't cause stack unbalance. Now perform whatever job you had in mind, then restore all the registers and RETN.

A bonus the circuit provides is to use the three remaining gates in the 74LS32 to create fully decoded input and output device-select pulses mapped at I/O addr. 6DH. These can be used for selecting say 8-bit I/O ports. The diagram to the right shows a schematic for achieving this.

BY THE WAY , HAPPY NEW YEAR EVERY BODY !!!!!!

Note : Multiple NMI are possible by priority encoding. (initially)



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LIST

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Huntington, NY
Library
2 PM

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NY 25A Main Street
Huntington, N.Y.

January 12, 1986 (Sunday)
at 2:PM

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Go left on 25A. Library is 4 blocks
down on the left.

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